

Interrelation of saturated fat, trans fat, alcohol intake, and subclinical atherosclerosis

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Background: Intake of saturated fat, trans fat, and alcohol alter cardiovascular disease risk, but their effect on subclinical atherosclerosis remains understudied.

Objective: The objective was to examine and quantify the interrelation of saturated fat, trans fat, alcohol intake, and mean carotid artery intimal medial thickness (IMT).

Design: We conducted a population-based, cross-sectional study among 620 persons of Aboriginal, South Asian, Chinese, or European origin aged 35–75 y, who had lived in Canada for ≥ 5 y. Mean IMT was calculated from 6 well-defined segments of the right and left carotid arteries with standardized B-mode ultrasound, and saturated fat, trans fat, and alcohol intakes were measured with validated food-frequency questionnaires.

Results: For every 10-g/d increase in saturated fat intake, IMT was 0.03 mm higher ($P = 0.01$) after multivariate adjustment. A 1-g/d higher intake of trans fat was associated with a 0.03-mm higher IMT ($P = 0.02$) after multivariate adjustment. The ratio of polyunsaturated to saturated fat (P:S) was inversely associated with IMT after multivariate adjustment (change in IMT: -0.06 mm; $P < 0.01$). Saturated and trans fat intakes were independently associated with IMT thickness (change in IMT: 0.03 mm; $P < 0.01$ and 0.02, respectively; P for interaction = 0.01). Polyunsaturated, monounsaturated, cholesterol, and total fat intakes were unrelated to IMT. The relation between saturated fat intake and IMT strengthened ($\beta = 0.0066$, $P < 0.001$) in persons who never or rarely consumed alcohol as compared with moderate or heavy drinkers ($\beta = 0.0001$, $P = 0.79$, P for interaction = 0.01).

Conclusion: Higher habitual intakes of saturated and trans fats are independently associated with increased subclinical atherosclerosis, and alcohol intake may attenuate the relation between saturated fat and subclinical atherosclerosis.

Key Words: Saturated fatty acids • trans fatty acids • alcohol • carotid atherosclerosis • ethnicity.